University of Bahrain
College of Information Technology
Department of Computer Science
Semester 1, 2014-2015
ITCS 103/ITCS 111 (Computer Programming)

Test 2 – Form A

Date: 26th November 2014 **Time: 11:00-12:30PM**

STUDENT NAME	
STUDENT ID #	
SECTION #	

NOTE: THERE ARE SIX (6) PAGES IN THIS TEST
WRITE ONLY ONE SOLUTION FOR EACH QUESTION

Question #	MARKS		COMMENTS
1	10	10	
2	10	10	
3	10	10	
4	10	10	
TOTAL	40	40	

Question 1 (10 Points)
What is the output of the following codes?

(1)
```
string A = "Good morning";
string B = "Good afternoon";
if (A > B)
      cout << A;
else
      cout << B;
```

Good morning

Good morning

2

(2)
```
int a = 5, b = 3;
switch( a - b ){
   case 0: cout<<"iPhone\n"; break;
   case 1: case 2: cout<<"Android\n"; break;
   default: cout<<"Blackberry\n";
}
cout<<"is my preferred Smartphone";
```

5 - 3 ⇒ 2

Android
is my preferred Smartphone

2

(3)
```
int x = 3;
do {
     ++x;
     if ( x % 5 == 1)
          break;
     cout << x << endl;
} while ( x < 9 );
```

4 5 6 %5 → 4 0 1

4
5

3

(4)
```
int x,y;
for(x=4;x>=2;--x){
     for(y=1;y<=x;++y)
          cout<<x;
     cout<<endl;
}
```

x = 4
y = 1 2 3 4 5

4444
333
22

3

x = 3
y = 1 2 3 4

x = 2
y = 1 2 3

x = 1

Question 2 (10 Points)

A leap year is a year containing one additional day that is added to February month. Other years are called common year. Write a C++ program that prompts the user to enter the year (**int**), and displays whether that year is considered leap or common year. To identify year type, use the following rules:

Rule	Type
Year isn't divisible by 4	Common Year
Year is divisible by 4 but not divisible by 100	Leap Year
Year is divisible by 400	Leap Year
Otherwise	Common Year

For example, if the user entered Year 2000, the program should display that ***Year 2000 is a Leap Year***. If the user entered Year 2005, the program should display that ***Year 2005 is a Common Year***.

```
#include <iostream>
using namespace std;
int main(){
  int y;
  cout<<"Enter the year: ";
  cin>>y;
  if(y%4>=1)
    cout<<"Year "<<y<<"is a Common Year";
  else if( y%4==0 && y%100>=1)
    cout<<"Year "<<y<<"is a Leap Year";
  else if( y%400==0)
    cout<<"Year "<<y<<" is a Leap year";
  else
    cout<<"Year "<<y<<"is a Common year";
  return0;
}
```

10

Question 3 (10 Points)

Write a C++ program to monitor the sick leaves given by the doctors to their patients. The doctor will run the program every day. For each patient, the doctor will enter the patient CPR (**Negative to Stop**) and the number of sick leave days, where zero indicates no sick leave was given. The doctor is allowed to give a maximum 2 days for a sick leave. If the patient needs more than 2 days to recover then the patient will be transferred to medical committee. The program should count and display the number of patients with sick leave(s) and the number of patients transferred to the medical committee.

A sample input/output of the program is given below:

```
Enter patient CPR (Negative to Stop): 940707075
Enter no. of sick leave days: 4

Enter patient CPR (Negative to Stop): 960107071
Enter no. of sick leave days: 2
..

..
Enter patient CPR (Negative to Stop): -5

No. of Patients with Sick Leave  = 3
No. of Patients Transferred to Medical Committee= 5
```

```
#include <iostream>
using namespace std;
int main() {
    int days, c=0, tr=0;
    long cpr;
    cout << " Enter patient CPR (Negative to Stop): ";
    cin>> cpr;
    while ( cpr>= 0){
      cout << " Enter no. of sick leave days:  ";
      cin>> days;
      if ( days>0  && days <= 2)
          ++c;
      else if ( days>2)
          ++tr;
      cout << " Enter patient CPR (Negative to Stop): ";
      cin >> cpr;
    }
    cout << endl;
    cout <<"No. of patients with Sick leave=  ";
    cout << c <<endl;
    cout <<"No. of patients Transferred to Medical Conmittee =  ";
    cout << tr;
    return 0;
}
```

Question 4 (10 Points)

A program analyzer is needed to counts the number of letters only from an input filed called **article.txt**. Write a C++ program that reads the input file and displays the number of letters found.

SAMPLE INPUT/OUTPUT

article.txt (input file)	SCREEN
The process of developing and implementing various sets of instructions to enable a COMPUTER to do a certain task.	No. of Letters found is 95

```
#include <iostream>
# include <fstream>
using namespace std;
int main() {
    int c=0;
    char letter;
    ifstream fin;
    fin.open("article.txt");
    while (fin){
     fin >> letter;
      if(letter>='a' && letter<='z')
          ++c;
      else if (letter >='A' && letter <= 'Z')
          ++c;
     }
    cout <<"No. of letters found is " << c;
    fin.close();
    return 0;
}
```

10